March 14, 2012

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: Amendment of Parts 1, 2, 22, 24, 27, 90 and 95 of the Commission's Rules to Improve Wireless Coverage through the Use of Signal Boosters, WT Docket No. 10-4

Dear Ms. Dortch:

In furtherance of the Commission's goals in this proceeding "to facilitate the development and deployment of well-designed signal boosters that do not harm wireless networks," Verizon Wireless and Wilson Electronics jointly developed a proposal ("Joint Proposal") for the design, operation, and, where necessary, installation of signal boosters.[1] A key element of the Joint Proposal is a set of technical specifications for Consumer Boosters, which are small fixed or mobile boosters that can be purchased, installed and operated by consumers.

To assist the Commission in its consideration and adoption of the Consumer Booster technical specifications, the companies have translated those technical specifications into draft rules. In so doing, Verizon Wireless and Wilson made some changes to the original specifications. These changes were made to simplify the specifications, to clearly state the conditions under which consumer boosters that meet the specifications can be certified, marketed, and operated, and to accommodate some of the suggestions made by Sprint Nextel, and T-Mobile/Nextivity in discussions with those entities and in their recent filings.

Wilson and Verizon Wireless urge the Commission expeditiously to adopt these draft rules. The consumer booster technical specifications embodied in this rules will provide several public interest benefits, including:

- Coverage Benefits – Consumer Boosters that meet these specifications will significantly improve voice and broadband data coverage in rural and in-building

[1] Letter from Verizon Wireless and Wilson Electronics to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 10-4, filed July 25, 2011.

scenarios,[2] thus furthering Commission goals of improving broadband coverage and public safety communications.

- Neutrality – The specifications are technology neutral and provide protection for all CMRS network technologies that are used and planned for Cellular, PCS, AWS and 700 MHz bands.
- Affordability – Boosters that meet the specifications will be affordable to consumers, with estimated prices expected to range from $100-$300 for Mobile Consumer Boosters and $200-$500 for Fixed Consumer Boosters.
- Flexibility – The specifications would allow boosters to be designed to operate in both mobile and fixed environments and on multiple frequency bands, thus providing consumers with the ability to continue to use boosters, subject to re-registering the booster, even if they switch service providers.
- Compatibility – The specifications will protect wireless networks from the interference, thus enabling boosters to be used without harming coverage and service quality for others.

Wilson and Verizon Wireless look forward to continuing to work with the Commission towards adopting these rules and the other aspects of the Joint Proposal.

Sincerely,

VERIZON WIRELESS

By: _____
John T. Scott, III
Andre J. Lachance
VERIZON
1300 I Street, N.W., Suite 400-West
Washington, D.C. 20005
(202) 589-3760

Attorneys for Verizon Wireless

WILSON ELECTRONICS, INC.

By: _____
Russell D. Lukas
Lukas, Nace, Gutierrez & Sachs, LLP
8300 Greensboro Drive, Suite 1200
McLean, VA 22102
(703) 584-8660

Attorney for Wilson Electronics, Inc.

Attachments

[2] *See* Letter from Wilson Electronics to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 10-4, filed March 1, 2012 (demonstrating improved cell site coverage and connectivity through the use of Consumer Boosters).

PART 20—COMMERCIAL MOBILE RADIO SERVICES

1. The authority citation for Part 20 is amended to read as follows:

AUTHORITY: 47 U.S.C. 154, 160, 201, 251-254, 301-303, and 332 unless otherwise noted.

2. Section 20.3 is revised by adding definitions to read as follows:

§ 20.3 Definitions.

Signal booster. A device that automatically receives, amplifies, and retransmits on a bi-directional basis, the signals received from base, fixed, mobile, or portable stations, with no change in frequency or authorized bandwidth.

Consumer booster. A signal booster that meets the requirements of §20.16.

Fixed consumer booster. A consumer booster designed to operate in a fixed location.

Mobile consumer booster. A consumer booster designed to operate in a moving vehicle.

3. Add new § 20.16 to read as follows:

§ 20.16 Interim operation of certificated consumer boosters.

Consumer boosters operated by subscribers in good standing of a commercial mobile radio service system are considered to be operating under the authorization of that commercial mobile radio service system. Consumer boosters operated by subscribers in good standing of a commercial mobile radio service system, while receiving service from a different commercial mobile service system, are considered to be operating under the authorization of such different system. Subject to the requirements set forth below, consumer boosters that have been certificated in accordance with § 20.16(b) may be operated by a subscriber in good standing of a commercial radio service on the frequency bands listed in § 20.16(a). The requirements of this section apply to all consumer boosters except for those authorized by a provider for use in its licensed spectrum.

(a) *Frequency bands.* Consumer boosters may be operated on frequencies used for the provision of subscriber-based services under Parts 22 (Cellular), 24 (Broadband PCS), and 27 (AWS-1, 700MHz Lower A-E Blocks, and 700MHz Upper C Block) of this chapter.

(b) *Certification requirements.* A consumer booster can only be certificated and operated if it complies with all applicable rules in this Section 20.16 and all applicable technical rules for the frequency band(s) of operation including, but not limited to: §22.355, Public Mobile Services, frequency tolerance; §22.913, Cellular Radiotelephone Service effective radiated power limits; §22.917, Cellular Radiotelephone Service, emission limitations for cellular equipment; §24.232, Broadband Personal Communications Service, power and antenna height limits; §24.235 Broadband Personal Communications Service, frequency stability; §24.238, Broadband Personal Communications Service, emission limitations for Broadband PCS equipment; § 27.50,

Miscellaneous Wireless Communications Services, power limits and duty cycle; and §27.53, Miscellaneous Wireless Communications Services, emission limits; §27.54 Miscellaneous Wireless Communications Services, frequency stability.

(c) Operator responsibility. The operator of a consumer booster must comply with all applicable rules in this part and any other applicable part under this chapter. The operator is the person or persons with control over the functioning of the consumer booster, or the person or persons with the ability to deactivate it in the event of technical malfunctioning or harmful interference to a primary radio service. The operator of a consumer booster must only use approved antennas and cables as specified by the manufacturer of the consumer booster. Failure to comply with all applicable rules in this subpart and all applicable technical rules for the frequency band(s) of operation voids the authority to operate a consumer booster.

(d) *Operation on a secondary, non-interfering basis.* Operation of consumer boosters under this subpart is on a secondary, non-interference basis to primary services licensed for the frequency bands on which they transmit, and to primary services licensed for the adjacent frequency bands that might be affected by their transmissions. The operation of consumer boosters must not cause harmful interference to the communications of any primary licensed service. If a service provider or Commission representative directs the operator to deactivate the consumer booster, the operator must deactivate the booster immediately.

(e) *Registration.* Prior to operating any consumer booster, subscribers are required to register consumer boosters either electronically if the booster enables electronic registration or by contacting their service provider(s), and providing the following information: booster make and model number, FCC ID #, frequency bands supported, contact name, address, location of intended use, email, and mobile phone number.

(f) *Technical requirements.* A consumer booster can only be certificated and operated if it complies with all of the technical requirements of Section 20.16.

(i) *Noise limits.*

(A) The transmitted noise power in dBm/MHz of consumer boosters at their uplink port shall not exceed -103 dBm/MHz – RSSI.

Where RSSI is the downlink composite received signal in dBm at the booster input port from the base station for each band of operation.

(B) The transmitted noise power in dBm/MHz of consumer boosters at their uplink and downlink ports shall not exceed the following limit:

Fixed booster maximum noise power shall not exceed -102.5 dBm/MHz + 20 Log (Frequency). Where, Frequency is the uplink mid-band frequency of the supported spectrum bands in MHz.

Mobile booster maximum noise power shall not exceed -59 dBm/MHz.

(ii) *Bidirectional Capability.* Consumer Boosters must be able to provide equivalent uplink and downlink gain and conducted uplink power output that is at least 0.2 watts. One-way consumer boosters (i.e. uplink only, downlink only, uplink impaired, downlink impaired) are prohibited. Spectrum block filtering may be used provided the uplink filter attenuation is not less than the downlink filter attenuation.

(iii) *Booster Gain Limits.*

(A) The uplink gain in dB of a consumer booster shall not exceed -34 dB – RSSI + MSCL.

Where RSSI is the downlink composite received signal in dBm at the booster input port from the base station for each band of operation.

Where MSCL (Mobile Station Coupling Loss) is the minimum coupling loss in dB between the wireless device and input port of the consumer booster. MSCL must be calculated or measured for each band of operation and provided in compliance test reports.

(B) The uplink and downlink gain of a Consumer Booster shall not exceed the following limit:

Fixed Booster maximum gain shall not exceed 6.5 dB + 20 Log (Frequency) Where, Frequency is the uplink mid-band frequency of the supported spectrum bands in MHz.

Mobile Booster maximum gain shall not exceed 50 dB when using an inside antenna, 23 dB when using direct contact coupling, or 15 dB when directly connected.

(iv) *Power Limits.* A booster's uplink power must not exceed 1 watt composite conducted power and equivalent isotropic radiated power (EIRP) for each band of operation. Composite downlink power shall not exceed 0.05 watt (17 dBm) conducted and EIRP for each band of operation. Compliance with power limits will use instrumentation calibrated in terms of RMS equivalent voltage.

(v) *Out of band emission limits.* Booster out of band emissions (OOBE) shall be at least 6 dB below the FCC's mobile emission limits for the supported bands of operation. Compliance to OOBE limits will utilize high peak-to-average signal types.

(vi) *Booster Antenna Kitting.* All consumer boosters must be sold with user manuals specifying antennas and cables that meet the requirements of this section. Mobile consumer boosters *must* be sold together with antennas, cables, and/or coupling devices that meet the requirements of this section. The grantee is required to submit a technical document with the application for type acceptance that shows compliance of antennas, cables and/or coupling devices with the requirements of this section.

(vii) *Transmit Power Off Mode.* When the consumer booster cannot otherwise meet the power, emissions, noise and gain limits defined herein it must operate in "Transmit Power OFF Mode". In this mode of operation the uplink and downlink noise power shall not exceed -70 dBm/MHz and uplink gain shall not exceed the lesser of 23 dB or MSCL.

(viii) *Uplink Inactivity.* When a consumer booster is not serving an active device connection after 15 minutes the uplink noise power shall not exceed -59 dBm/MHz or -113 dBm/MHz – RSSI.

(g) *Interference safeguards.* Consumer boosters must include features to prevent harmful interference including, at a minimum, those enumerated in this subsection. These features may not be deactivated by the operator and must be enabled and operating at all times the signal booster is in use.

(i) *Anti-Oscillation.* Consumer boosters must be able to detect and mitigate (i.e. by automatic gain reduction or shut down), any oscillations in uplink and downlink bands. Oscillation detection and mitigation must occur automatically within 0.3 seconds in the uplink band and within 1 second in the downlink band. In cases where oscillation is detected, the booster must continue mitigation for at least one minute before restarting. After five such restarts, the booster must not resume operation until manually reset.

(ii) *Gain control.* Consumer boosters must have automatic limiting control to protect against excessive input signals that would cause output power and emissions in excess of that authorized by the Commission.

(h) *Labeling requirements.*

(i) Consumer booster manufacturers, distributors, and retailers must ensure that all consumer boosters marketed on or after [insert date six months after the effective date of this rule] include the following advisory (1) in any marketing materials, (2) in the owner's manual, and (3) on the outside packaging of the device:

WARNING. Operation of this device is on a secondary non-interference basis and must cease immediately if requested by the FCC or a licensed wireless service provider. No person may operate this device without approved antennas and cables as specified by the manufacturer. No person may operate this device without first registering the device with their wireless service provider.

(ii) Consumer booster manufacturers, distributors, and retailers must ensure that all consumer boosters marketed on or after [insert date six months after the effective date of this rule] include the following advisory (1) in any marketing materials, (2) in the owner's manual, and (3) on the outside packaging of the device:

WARNING. E911 location information may not be provided for calls served by using this consumer booster.

(i) *RF Exposure.* Consumer boosters are subject to the radio frequency radiation exposure requirements specified in sections 1.1307(b) and 2.1091 of this chapter. Consumer boosters operating in fixed and mobile exposure conditions are subject to routine environmental evaluation pursuant to the above sections. Applications for equipment authorization of consumer boosters with respect to 1.1307(b) and 2.1091 must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions; and technical information showing the basis for this statement must be submitted to the Commission upon request.

(j) *Marketing of Non-Conforming Boosters.* No person, manufacturer, distributor, or retailer may market, distribute or offer for sale any consumer booster that does not comply with the requirements of this Section to any person in the United States or to any person intending to operate the signal booster within the United States at any time after [insert date six months after the effective date of this rule].